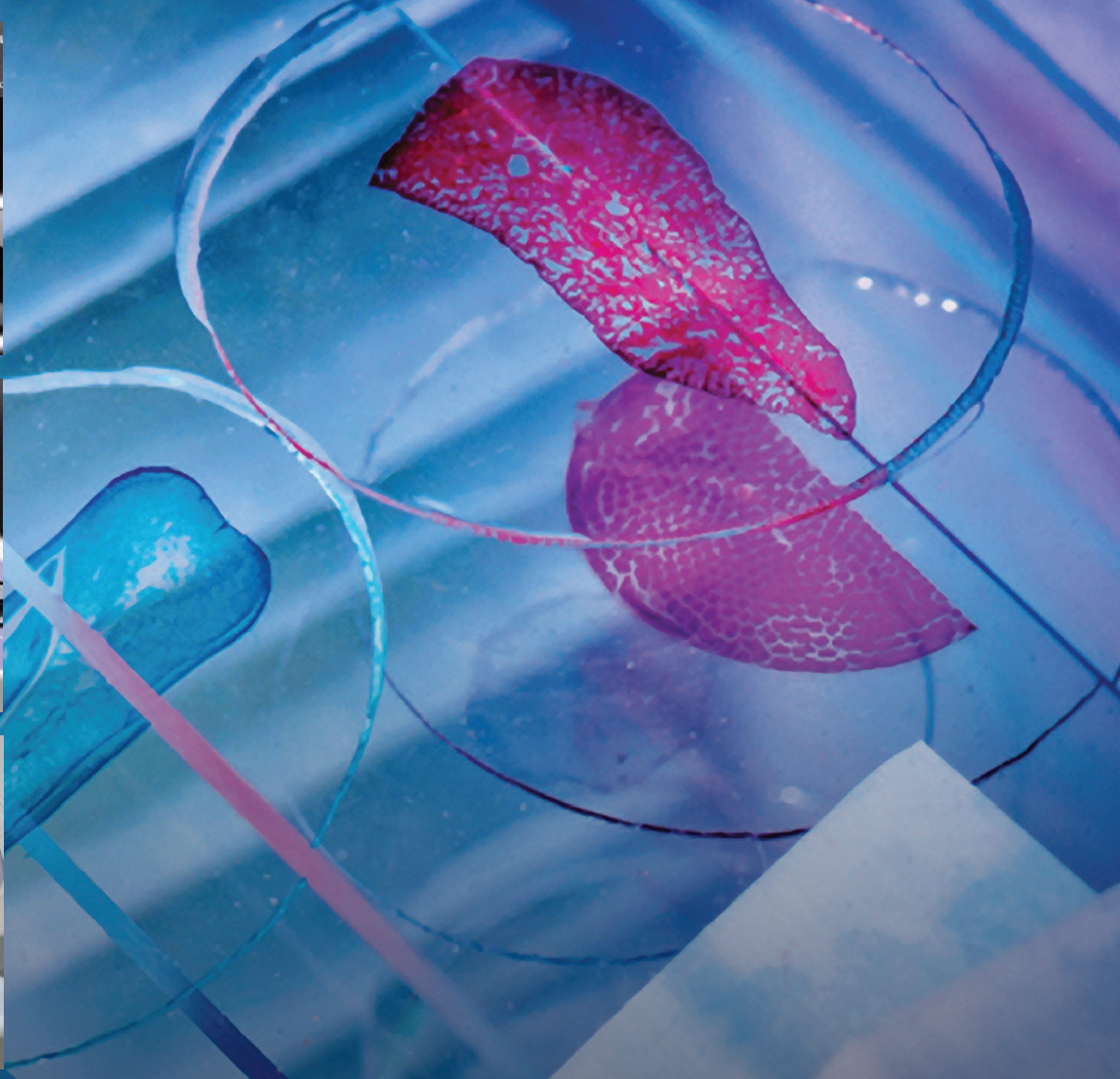




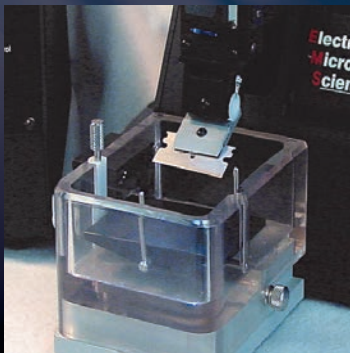
State-of-the-art equipment meeting the highest standards of precision and accuracy.



**Electron  
Microscopy  
Sciences**

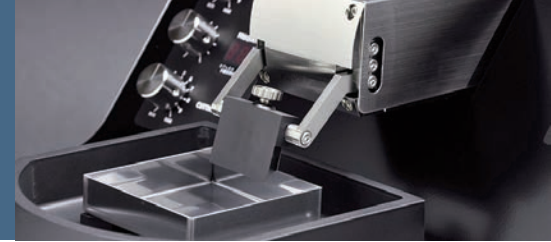
# Tissue Slicers and Microtomes

- DSK Vibrating Blade Tissue Slicers
- 7000smz-2, 5100mz, and 5100mz-plus Vibrating Microtomes
- The EMS Family of Tissue Slicers





# The DSK Line-Up of Vibrating Blade Tissue Slicers



Neo-Linear Slicers (NLS) are the next-generation models of slicing machines available since 2014. Linear Slicers (LS) have been in production since 2001, and the Micro Slicer (MS) has been around for more than 30 years. NLS are the most advanced models of LS compared to the least advanced MS models, although the basic mechanism is almost the same. They each offer varying degrees of performance versus cost-effectiveness.

The difference between NLS, LS and MS is in the horizontal swing mechanism, while MS is swinging sideways from the DC motor via cam. NLS and LS are transversely swung with electromagnets (linear motor type).

Although it is impossible to suppress the vertical swing which would inevitably create a bad vibration with the mechanism of the motor and the cam, the linear motor with only the linear motion (horizontal swing) theoretically, even if various conditions such as the resonance of the chassis and the cover were put in, reduces the longitudinal shake to approximately 1  $\mu\text{m}$  (2  $\mu\text{m}$  even at maximum swing).

**Vertical swing = poor vibration  
= death of nerve cell**

## Performance

In the NLS series, a vibration suppression table is built in, shrinking the vertical swing further, thus becoming soft. In test demonstrations, we received positive feedback including: "Synapse's response (liveliness) is good," and "Even those who are unfamiliar are able to cut cleanly," and "Good condition is obtained".

Improving on the original success of the MS series with its higher basic performance than competitors' comparable products, the LS series is the next highest model in the lineup. The DC motor will degrade as much as you use it by nature and the torque will decrease. Depending on the frequency of use, the motor may show signs of wear in three years. On the electromagnet, there is no such degradation, however, it's best to adjust it once every few years.

Although NLS and LS models demonstrate the best performance in raw samples, it is due to the difference in the lateral swing mechanism described above that the fixed specimen can be cleared more than MS. It is the LS series that can cut thinner more beautifully, and the NLS series is even better.

## Applications

- Physiology
- Neuroscience/Neurochemistry
- Pharmacology
- Toxicology
- Pharmacokinetics
- Histochemistry/Cytochemistry
- Enzyme cytochemistry at EM level
- Tissue sectioning for histopathology
- Botany (horticultural science, breeding, research, plant pathology)
- Regenerative medicine/Tissue engineering
- Tissue culture
- Other research areas using live tissue sections

## Neo-Linear Slicer Models AT and MT

### The further evolution of vibrating blade tissue slicers.

Available in two models, the high performance Neo-Linear Slicer AT model and the standard Neo-Linear Slicer MT model, these slicers provide excellent performance when it comes to producing better, much thinner, sections of live tissues.

Each uses steel plate housing instead of plastic to eliminate defective vibrations caused by resonance as much as possible. Both feature conveniences such as detachable, sterilizable blade holders and deep ice trays.

The flagship AT Tissue Slicer has automatic functions, making it very useful when you need a large number of slices or when making continuous sections. The auto control program and control platform has been modernized, providing for easier workflow and maintenance.

### Optional Accessories

Available options include a loupe, a magnification mirror with LED lighting, and a large ice bath with designated specimen tray.



Neo-Linear Slicer AT



Neo-Linear Slicer MT

## Specifications: Models AT and MT

<b>Blade Vibration</b>	50-100Hz
<b>Vibration Width</b>	0-2mm
<b>Abnormal Vibration</b>	2 $\mu\text{m}$ at the maximum/1 $\mu\text{m}$ regularly
<b>Forward Speed</b>	0-44mm/min
<b>Back Speed</b>	71mm/min
<b>Vertical Movement</b>	15mm
<b>Area of Sectioning</b>	30x30mm
<b>Outer Size</b>	345 x 500 x 240mm 13.6 x 19.7 x 9.4in
<b>Weight</b>	35Kg
<b>Power</b>	100V 2A 50/60Hz

## Ordering Information

Cat No.	Description	Qty.
93300	Neo-Linear Slicer AT	each
93301	Neo-Linear Slicer MT	each
<b>Optional Accessories</b>		
93300-01	2x Magnifying Loupe w/LED lights, UV cut coating	each
93300-02	Large Ice Bath, 500ml cap. w/ specimen tray	each

The DSK Line-Up of Vibrating Blade Tissue Slicers (continued)



**Linear Slicer  
Model PRO 7N**

The advanced model with electromagnet-generated linear vibration.

The Linear Slicer is the first in the world to feature lateral vibration by linear motor (electromagnet). This model, which drastically reduces poor vibrations and minimizes the death of nerve cells, will definitely help with research activities.

The swing width can be adjusted without changing the vibration frequency. Additionally, the advance speed is adjustable.



Linear Slicer PRO 7N

**MicroSlicer®**

The standard models for cutting live tissues.

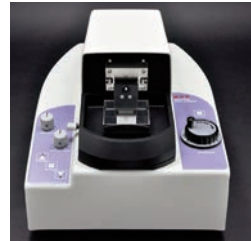
Available in two models — the automated MicroSlicer Zero1N model and the lower-cost manually operated DTK-1000 model.

In the Zero1N Model, vertical up and down movement of the specimen is made electrically by a built-in stepping motor. The built-in retraction mechanism lowers the specimen after each sectioning to protect the damage of the specimen surface by the blade backing to the initial position. This improves usability and performance.

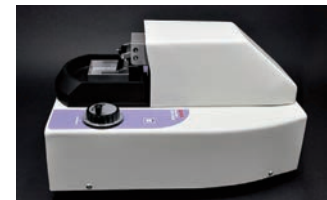
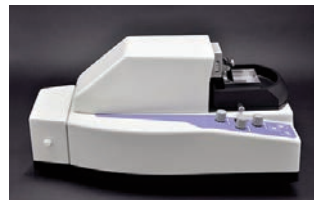
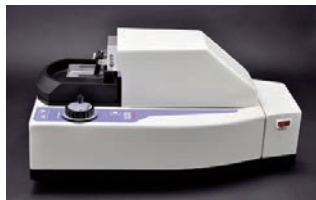
The DTK-1000 Model, combines high basic performance and economic efficiency. The retraction mechanism is not available in this model.



MicroSlicer Zero1N



MicroSlicer DTK-1000



**Specifications: Model PRO 7N**

<b>Blade Vibration</b>	50-100Hz
<b>Vibration Width</b>	0-2mm
<b>Forward Speed</b>	0-44mm/min
<b>Back Speed</b>	71mm/min
<b>Vertical Movement</b>	10mm
<b>Area of Sectioning</b>	25x30mm
<b>Outer Size</b>	300 x 550 x 250 mm 11.8 x 21.7 x 9.8 in
<b>Weight</b>	28Kg
<b>Power</b>	100V 2A 50/60Hz

**Specifications:**

	<b>Model Zero 1N</b>	<b>Model DTK-1000N</b>
<b>Specimen Advance</b>	Motorized	
<b>Specimen Retraction</b>	Yes	No
<b>Blade Vibration</b>	0-55Hz	
<b>Vibration Width</b>	2mm (fixed)	
<b>Forward Speed</b>	0-68mm/min	
<b>Back Speed</b>	104mm/min	
<b>Vertical Movement</b>	10mm (manual operation)	
<b>Area of Sectioning</b>	25x30mm	
<b>Outer Size</b>	300 x 500 x 300 mm (11.8 x 19.7 x 11.8 in)	
<b>Weight</b>	21Kg	
<b>Power</b>	100/120/220/240V 1A 50/60Hz	

**Optional Accessories for PRO 7N, MicroSlicer® Zero 1N, and MicroSlicer® DTK-1000**

Available options include a loupe and a large ice bath with designated specimen tray.



Loupe — 2x Magnification/  
UV cut coating



Large Ice Bath,  
500 mL cap.



MicroSlicer®  
Blade Holder

**Ordering Information**

Cat No.	Description	Qty.
93302	Linear Slicer PRO 7N	each
<b>Optional Accessories</b>		
93300-01	2x Magnifying Loupe w/LED lights, UV cut coating	each
93300-02	Large Ice Bath, 500ml cap. w/ specimen tray	each

**Ordering Information**

Cat No.	Description	Qty.
93303	MicroSlicer Zero 1N	each
93304	MicroSlicer DTK-1000	each
<b>Optional Accessories</b>		
93300-01	2x Magnifying Loupe w/LED lights, UV cut coating	each
93300-02	Large Ice Bath, 500ml cap. w/ specimen tray	each
93300-03	MicroSlicer Blade Holder	each
93300-04	Tool for MicroSlicer Blade exchange	each
93300-05	MicroSlicer Replacement Twin Bulb	each



# 7000smz-2, 5100mz, and 5100mz-plus Vibrating Microtomes

**Top-of-the-range, high precision, vibrating microtomes...the finest slicers in the world for all specimen preparation.**

The 7000smz-2 unit with a Z-axis deflection of Sub-Micron and a blade advance controllable to 10 microns/second. The 5100mz-Plus and 5100mz are very competitively priced high precision units with a Z-axis deflection of only 1-2 microns and a blade advance controllable to 10 microns/sec. On all units the section thickness step size is 0.001mm. The 7000smz-2 and 5100mz-Plus are supplied with their own Z-axis calibration verifier.

All types of sectioning is possible including sectioning for visual patching of neurological tissue, heart, and lung, and much more...

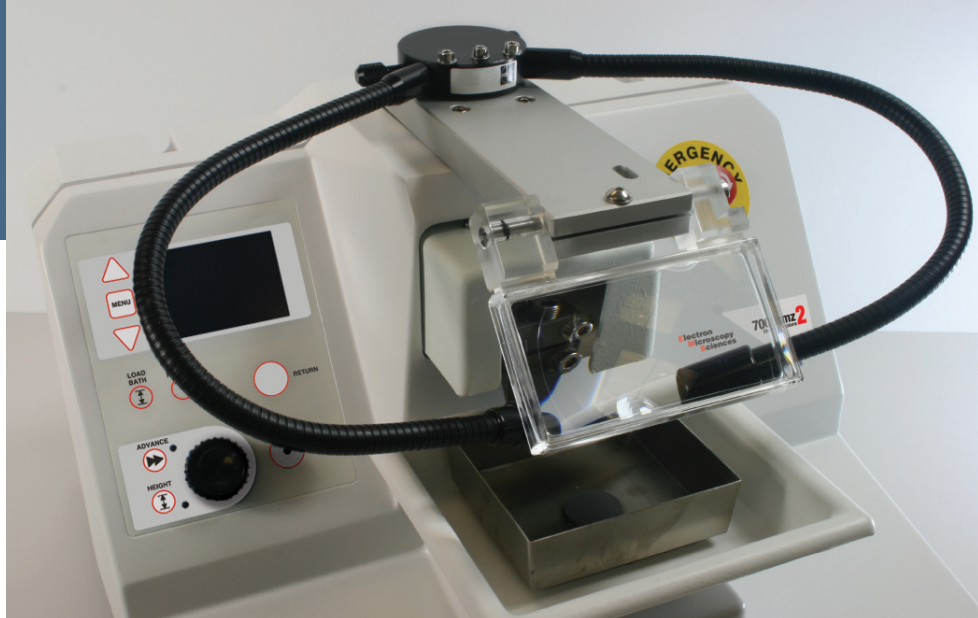
The effect of excessive Z-axis deflection on the health and viability of the tissue preparation has been much discussed since the publication of Jonas et al (2003) and the 7000smz-2 will now deliver perfect sections every time with sub-micron Z-axis deflection across a wide range of vibration speeds and amplitudes. The affordable 5100mz-Plus offers almost the same features with Z-axis deflection of 1-2 microns at all vibration speeds and amplitudes, which is less than most other microtomes on the market.

The all-new user interface is both easy to use and versatile. The 7000smz-2 and both 5100mz models offer similar operation at the press of a button. The versatility includes simple operation at the push of a button or a range of changeable and programmable parameters and a menu enables the settings of your own preferences.

The 7000smz-2 also gives you longevity of performance; in other words it not only gives submicron performance out-of-the-box, but the advance vibrating mechanism does not contain bearings and other components subject to wear. Consequently it will retain the sub-micron Z-axis deflection performance for years to come, giving you consistency in your biological preparation.

Tissue cooling is accomplished by the use of either an ice-water bath or an electronically controlled thermo-electric cooler. Other options include a LED cold light source and a magnifier or a stereoscope for clear observation whilst slicing.

The new 5100mz series Vibrating Microtomes share the user interface with the premium 7000smz-2, placing a wide range of adjustable parameters at the user's fingertips. Use in fully manual or the semi-automated "slice window" mode which automatically remembers the start and finish position of the slice.



## FEATURES AT A GLANCE

### 7000smz-2:

- Includes a Z-axis calibration unit
- Minimal Z-axis deflection (less than 1µm) at all speeds and amplitudes
- Z-axis blade adjust minimizer
- Blade holder angle to user requirement
- Set start and stop position of blade travel
- Tissue sample automatically retracted before blade returns to start point
- Full range of adjustable parameters with 8 customizable user profiles
- Vibration speeds from 50 to 120Hz
- Amplitudes from 0.5mm to 2.5mm
- Controlled blade advance at 10 microns per sec
- "Auto" programming by storage of the first slicing
- Ice water bath easily removed for cleaning
- Optional LED light and scope for clear observation
- Leaf spring vibratory mechanism for optimal longevity and accuracy

### 5100mz-Plus and 5100mz:

- Includes the Z-axis calibration unit (5100mz-Plus only)
- Mechanism Z-axis error of less than 10µm
- Vibration speeds from 50 to 80Hz
- Amplitudes from 0.5mm to 1.5mm
- Fine control of the blade advance (min. 0.1mm/sec)
- Set start and stop position of blade travel
- Remote controls allowing for sterile use in culture hood
- Ice water bath easily removed for cleaning
- Optional cold light and magnifier for clear observation
- Optional Peltier cooled bath
- Control handset allows full remote control

*5100 Series: Control box on umbilical cord ideal for operation in an isolated environment*

### Model 5100mz-Plus

The 5100-Plus is perfect for those who need to keep slices viable for longer, e.g. for electrophysiological field recordings. The user can calibrate the Z-axis deflection of the blade to 2µm with the adjustable blade holder and "optical" calibration device. Minimal Z-axis deflection reduces the "chatter" and minimizes damage to the slice surface, leading to greater viability of the cells on the slice surface.

### Model 5100mz

The 5100mz is a very competitively priced, high precision, vibrating microtome which shares many features with the top of the range 7000smz series, such as the vibrating mechanism, the inner and outer tissue baths and the easy to use control system.

This new entry level microtome is perfect for techniques such as histology, organotype slice culture and low resolution imaging with a fixed blade holder and a mechanism Z-axis error rate of 5-8µm.



## Options

### Temperature Controlled Standard Tissue Bath

Model 7610

The 7610-A Tissue Bath Cooler Unit is intended for use with our 7000 and 5000 range of vibrating microtomes. Unfixed brain slices sectioned at 4°C give better tissue preservation and are viable for longer in-vitro recordings. Additionally, some enzyme histochemical techniques give better staining results when sectioned at low temperatures.

The 7610 Series coolers use “Peltier” thermoelectric elements. The stainless steel tissue bath and mount are detachable to allow sterilization by autoclave if required.

The equipment comprises of a mains operated control unit, cooling element, tissue bath and specimen holder. The control unit houses a power supply and temperature control circuitry. The cooling element assembly consists of thermoelectric “Peltier” elements, temperature feedback sensors and a cold water fed heat exchanger.

Current from the power supply flows through the thermoelectric elements, which act as heat transfer units. Heat is drawn off, cooling the solution in the tissue bath. The heat generated by this process is removed by the water supply fed through the heat exchanger. The unit uses a proportional temperature control algorithm to maintain temperature stability. This will hold the bath temperature to within 0.5°C of the temperature set point. There will, however, be a small variation in temperature vertically through the bath. Experience will show the best temperature to be set for any given requirement and ambient temperature.



Tissue Bath mount

### Specifications

Display Resolution	0.1°C	Voltage Requirements	230V 50Hz or 115V 60Hz
Temperature Accuracy	+/- .5°C	Inlet Fuse Rating	2A
*Temperature Range	+8°C to 0°C		
Power Rating	60W		

*\*Note that the actual temperatures achievable will be dependent upon the solutions used and local temperature conditions*

### Integrally Mounted Cold Light Source

Model 7000-2-1

To facilitate the careful slicing operation, it is most important that the progress of the blade through the tissue be clearly observed. This observation is used to ensure control of the speed of advance and of the oscillation of the blade. Two elements are required for clear observation, light and magnification.



### Features

- Ability to direct the light where needed with two flexible fiber optic light guides.
- Maintains temperature stability of the tissue or surrounding a.c.s.f.
- Light Intensity is adjustable by a rotary dial knob.
- 20W/12V Halogen lamp
- 2000 hour life approx.
- Fan and electronic power supply
- Adjustable with potentiometer
- Twin 500mm fiber optic light guides

### Integrally Mounted Cold Light Source and Magnifying Glass

Model 5100-1-3

A magnifying glass for general global slices offering approximately 1.5x magnification. Integral cold light powered directly via the Model 5100mz Vibrating Microtome.

### Integrally Mounted Magnifying Glass

Model 7000-1-3



For general global slices a magnifying glass offering approx 2x magnification is sufficient. However, if specific loci are under study then an inspection microscope is desirable. The binocular inspection microscope with 10x-40x magnification, a zoom of 1x-4x and a working distance of 80mm is ideal for the task.

### Features

- 115mm Diameter
- 305mm Focal Length
- 2x Magnification

### Integrally Mounted Inspection Microscope

Model 7000-1-1

(x20-x40)

Model 7000-1-2

(x5 and x10)



### Upgrade Kit for 5100mz

Model 5100-1-45

Optional kit to upgrade the 5100mz to the 5100mz-Plus. Allowing the user to optimally calibrate the Z-axis deflection of the blade to 2± 0.1 µm.

**5100-1-45** Upgrade Kit for 5100mz each



7000smz-2, 5100mz, and 5100mz-plus Vibrating Microtomes (continued)

**Specifications**

**Section Thickness Step Size**

**Vertical (Z-Axis) Calibration Device**

*Campden's 'Opti-cal' is calibrated with metrology equipment traceable to National Standards*

**Optimal Z-axis Deflection**

**Max Specimen Size**

**Maximum (vertical) travel of bath table**

**Memory to store section thickness**

**Multiple user settings**

**Cutting head advance speed while slicing**

**Cutting head advance speed resolution while slicing**

**Cutting head advance speed max (fast mode when not slicing)**

**Specimen Retraction as blade retracts**

**Cutting Head Retraction Speed (fast mode)**

**Operating Modes**

**Blade Oscillation Frequency Range (dependent on amplitude)**

**Frequency Step Size**

**Blade Oscillation Amplitude**

**Amplitude Step Size**

**Cooling Options**

**Power Requirements**

**Power Rating**

**Fuse Rating (115v or 230v)**

**Light Source**

**Dimensions**

**Weight**

**Packaged Weight & Dimensions**

**7000smz-2**

1µm

'Opti-cal' included as standard

Sub-µm (± 0.1µm)

33x50x19

19mm

Yes

8 different

From a minimum of -1.00mm/sec, through zero to a maximum of +1.00mm/sec

0.01mm/sec

+/- 4.0mm/sec

Yes

4.0mm/sec

Manual, semi-auto 'slice window' or fully automated 'profile repeat'

50-120Hz

5Hz

Minimum: 0.5mm (nominal)  
Maximum: 2.5mm (nominal)

0.25mm (nominal)

Ice bath or optional Model 7610A Tissue Bath Cooler

115VAC 60Hz or 230VAC 50Hz (selectable)

100W

T2A 250VAC

100-240VAC 3W mains connection

420mm W x 400mm D x 270mm H (excluding light source and microscope)

35kg

Wooden crate 70 x 54 x 48cms, 55Kgs

**5100mz Series**

1µm

**5100mz Plus:** 'Opti-cal' included as standard

**5100mz:** 'Opti-cal' optional extra

~ 5-8µm (2.0µm ± 0.1 with calibration upgrade kit)

33x50x19

19mm

Yes

8 different

From a minimum of -1.00mm/sec, through zero to a maximum of +1.00mm/sec

0.10mm/sec

+/- 2.0mm/sec

Yes

2.0mm/sec

Manual or semi-auto 'slice window'

50-80Hz

5Hz

Minimum: 0.5mm (nominal)  
Maximum: 1.5mm (nominal)

0.5mm (nominal)

Ice bath or optional Model 7610A Tissue Bath Cooler

90-264 VAC 50/60Hz (switch mode PSU)

65W

T2A 250VAC

Powered from 5100mz

350mm W x 450mm D x 350mm H (excluding magnifier/light source)

15kg

Box wt & dims TBA

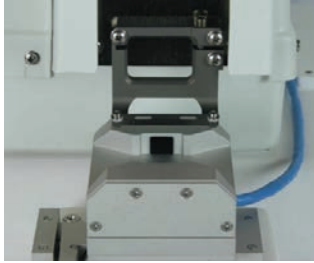


## Ordering Information

### 7000smz-2 and 5100mz-Plus, and 5100mz Vibrating Microtomes, Options, and Accessories

The finest vibration microtomes with sub-micron z-axis deflection at all speeds and amplitudes of vibration.

Cat No.	Description	Qty.
7000smz-2	Programable Vibrating Microtome, includes demountable tissue bath (7000-1-3) and sample blades in stainless steel and ceramic plus 'Opti-Cal' z-axis calibration device. 115 V or 230 V	each
5100mz-Plus	Vibrating Microtome, includes demountable tissue bath and sample blades in stainless steel and ceramic. 115V or 220V	each
5100mz	Vibrating Microtome, includes demountable tissue bath and sample blades in stainless steel and ceramic. 115V or 220V	each

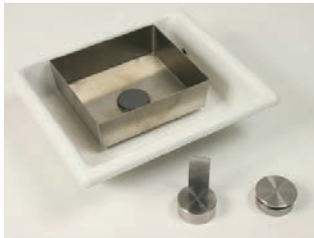


### Upgrade Kit for 5100mz

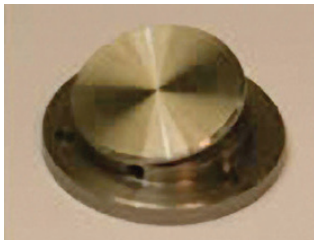
Model 5100-1-45

Optional kit to upgrade the 5100mz to the 5100mz-Plus. Allowing the user to optimally calibrate the Z-axis deflection of the blade to  $2\pm 0.1 \mu\text{m}$ .

Cat No.	Description	Qty.
5100-1-45	Upgrade Kit for 5100mz	each



Tissue Bath with Mount 7000-3-1A



7000-4-2



7000-6-1



7550-1-SS

### Optional Accessories

Cat No.	Description	Qty.
7610-A	Standard Temp. Controlled Tissue Bath (autoclavable) and Controller	each
7000-1-3	Magnifying Glass, mounted to machine	each
7000-1-2	Inspection Microscope fixed x5-x10	each
7000-1-1	Inspection Microscope zoom x20-x40	each
7000-2-1	Cold Light Source	each
5100-1-3	Integrally Mounted Cold Light Source and Magnifying Glass for 5100mz and 5100mz-Plus	each

### Spares and Accessories

Cat No.	Description	Qty.
7000-3-1A	Tissue Bath Mount (additional price only - this mount comes standard with purchase of 7000smz-2, 5100mz-Plus or 5100mz)	set
7000-3-2	Stainless steel inner specimen bath	set
7000-4-1	Specimen Mount Only	each
7000-4-2	Tilting Tissue Mount	each
7000-5-3	Blade holder- special angle, includes right and left hand clamp screws, single-axis adjustment screw	each
7000-6-1	'Opti-Cal' Z-axis measurement, traceable to national standards	each
7000-7-1	Blade handling tool	each
7000-50-1	Tool kit - hexagonal drivers	each
7000-60-1	Transit crate, includes packaging expansion bags	each

### Consumables

#### Stainless Steel Blades, Cat No. 7550-1-SS

Double beveled on both faces and honed to an acute cutting edge and hardened to 56 Rockwell. Nonetheless, the stainless steel is relatively soft and these blades are usually used once or at a maximum changed every day. These blades are for use in specially designed blade holders for Vibroslice instruments manufactured prior to 2003.

<b>Material</b>	Stainless Steel
<b>Dimensions</b>	38mm x 9mm x 0.5mm
<b>Geometry</b>	Double sided
<b>Bevel</b>	Double bevel
<b>Honing</b>	Ground edge
<b>Packaging</b>	50 per pack

Cat No.	Description	Qty.
7550-1-SS	Stainless steel blades - narrow, ultrasonically cleaned	pk/50

# EMS Family of Oscillating Tissue Slicers

**Innovative State-of-the-Art  
Oscillating Tissue Slicers for the  
most challenging of sectioning  
and the highest quality.**

The EMS 4500 and 5000 Oscillating Tissue Slicer represents the most thoughtfully designed solution to sectioning either fixed or fresh tissue. No longer is there a need for embedding or freezing your sample and preparation time is reduced dramatically. The risk of distortion and artifacts normally associated with these procedures are eliminated. The EMS 4500 and 5000 meets the highest standards for precision and accuracy and it meets or exceeds the performance of units on the market costing twice as much.

## The EMS Tissue Slicer Family

The EMS 5000 series may be used for the sectioning of samples for use in the fields of electrophysiology of fresh tissue, immunocytochemistry and immunohistochemistry, Neurophysiology, Neuropathology, Experimental Biology, Histology, Cytology, Botanical Research, Microscopy, Polymer and Materials Science. The EMS 5000 now features a new innovative design of the slicer head which minimizes Z-Axis vibration. This improvement dramatically improves slice surface integrity and is especially beneficial in the field of fresh tissue where IR/DIC imaging methods are concerned. The unique blade holder has now been modified to accept: razor, sapphire, diamond and glass blades.

To reduce time between slices the EMS 5000 series features a user programmable travel window (cutting window). This allows the sectioning cutting range of the blade to be customized to the specimen sample. This feature of "automatic sectioning" offers a beginning advance and end advance further automating the EMS 5000. In conjunction with our "home button" the programmable window guarantees rapid sectioning of even the largest of specimens. As well, the EMS 5000 allows the sectioning of samples in two different modes. In single slice mode, the unit sections samples and harvests them while the blade repositions itself to perform the next slice and in the multiple slice mode the EMS 5000 will automatically perform multiple uniform slices.

The EMS 5000 series control panel has been totally redesigned to allow for ambidextrous and ergonomic operation. The keypad has been sealed to avoid buffer spill seepage. The tray is made from molded clear polycarbonate for



*Electron Microscopy Sciences is committed to offering you the most up to date equipment on the market. If you have any ideas or would like to see us make any changes in our line please let us know all ideas and suggestions are encouraged. We look forward to hearing from you.*

improved viewing of the slicing operation. The tray is removable to facilitate specimen mounting and cleaning. Two white LED's are installed in the blade head, which provide constant cold illumination of the specimen during the slicing process.

The EMS 5000 series is engineered for maximum stability ensures even the most delicate of tissue to be cut successfully every time. The knife holder allows any blade (as per list) to be secured and the blade angle set from 10-20 degrees. The specimen mount is x, y, z axis adjustable and the knife advance is continuously adjustable with a touch of the keypad from 0-5mm/s and the section thickness is now adjustable in 1 micron increments ranging from 1-999 microns. Our precision slicer features automatic touch selection of section thickness, blade speed, advance, and a user-defined travel window so that the consecutive sections may be cut easily and rapidly. Other EMS 5000 features include: Touch pad control of the blade height, slice counter / slice thickness, precise bar graph displays of blade oscillation and advance speeds. Blade oscillation is adjustable from 50-5000 cycles/minute and advance speed is adjustable continuously from 100 microns - 5mm/sec.

Our EMS 5000 series is designed for easy operation and maintenance. The specimen collecting tray is removable and easy to clean.

All controls may be set with one hand with options for multiple slicing modes.

The unit comes complete with gooseneck magnifying lens, media tray (2.5" wide) and pedestal, specimen vice holder, blocks, as well as a foot switch with 6' cable. A large tray (3.5" wide) is available as an option and comes complete with fixed stage and adjustable pedestals.

The tissue pedestal with pivotal pin (included with media tray), allows for the mounting of a specimen directly to the pedestal and the ability to change the angle of your specimen relative to the blade, offering you perfect specimen orientation. The sample vice with pivotal pins (also included in package) allows for the adherence of your specimen directly to a mounting block.

The EMS 5000 series meets the highest standards for precision and accuracy. It meets or exceeds the performance of units on the market costing twice as much.



## The EMS 4500 Tissue Slicer

The EMS 4500 Tissue Slicer is a scaled down version of the EMS 5000. All of the specifications of the EMS 5000 are the same for the EMS 4500. The only difference between the two units are as follows:

The EMS 4500 does not include:

### Functional Features

1. Adjustable window
2. Multi-Slice function
3. Home functionality

### Accessories

1. Foot Switch
2. Tissue Blocks
3. Vice Holder

*The EMS 4500 can be upgraded to the complete EMS 5000 unit at any time.*



## Updates and Advantages of the EMS 5000 Series

- Cutting window for automatic sectioning allows for faster and more reliable sectioning.
- Control pad with membrane buttons is now separated from the slicer module improving ergonomics and reducing buffer spillage from contaminating the controls.
- X, Y, and Z – 3 axis adjustable specimen mount.
- Easy to release slicer head for safety and ease of specimen mounting.
- Slice thickness is now adjustable from 1-999 in 1 micron steps.
- One touch "home" button to return the blade arm to a predetermined point near the specimen.
- The specimen tray is made from a clear polycarbonate for improved viewing of the slice operation. No worry of leakage and section visualization in easy.
- The pivot pins which come as a standard on the pedestal as well as the vice holder allow changing of the angle of the pedestal relative to the blade. Easy sample orientation in all directions.
- The tray includes a lock on feature for a more secure mount to the platform.
- The standard unit comes complete with our unique pivotal tissue pedestal (you can mount the specimen directly on the pedestal without the need for vices or blocks mounted in the sample tray).

## The EMS 5000 Refrigerated Controller and Tray

The EMS 5000 Refrigerated Controller and Tray provide refrigeration capabilities to the 5000 Tissue Slicer. The controller three digit LED displays the current temperature of the bath medium in degrees C. The temperature is maintained within 0.5°C. The temperature range on the unit is between 0-10°C.

The refrigerated tray is fitted with a peltier heat exchange unit. A cold water source is circulated through the assembly to transfer heat. The tubing is connected to the tray with quick connect fittings. No tools are necessary for installation. The fittings are self sealing to prevent leaking during installation. The tray fits directly to the mounting platform of the EMS 5000.

## Features

- Control pad with membrane buttons separated from the slicer module to improve ergonomics, reduce "handedness", and isolate switches from bath solutions.
- New slicer head design increases blade motion stability and minimizes vibration that causes tissue distortion.
- Slice thickness from 0 to 999 microns, set in 1 micron increments. Push button advance; digital display of status.
- Easy release slicer head facilitates safe, easy specimen mounting as well as easy cleaning.
- Ultra light blade oscillation mechanism.
- Accepts metal, glass, diamond and sapphire blades.
- 3 axis adjustable specimen mount (X,Y,Z).
- User defined "travel window" reduces blade travel time between slices.
- User selectable slicing modes for "hands-free" performance of many slices.
- Slice counter/Slice thickness display.
- Precise bar graph displays of blade oscillation and advance speeds.
- Consistent live tissue slices of 10 microns achieved.
- Adjustable/Removable magnifier lens X2-Swings away when not in use.
- White LED's mounted to knife holder for constant, direct, cold source illumination during slicing.
- Blade mechanism above bath simplifies maintenance; easy to clean removable tray.
- Mounting of the specimen can be done directly on our unique tissue pedestal (with the option of using the pivot pin [see Diagram 1] or just setting the pedestal flat on the bottom of the tray on a 90° angle [see Diagram 2] in addition a sample vice holder, with pivot pin can be attached to the tray and mounting blocks used [see Diagram 3] – (both devices come standard with unit).
- Adjustable knife angle indicator is built into the arm of the unit.

## EMS Family of Oscillating Tissue Slicers (continued)



### Control Keypad

#### Blade Position

**Forward:** Moves the blade arm forward at the set advance speed. Press once to begin movement, again to stop.

**Reverse:** Moves the blade arm back at the maximum travel speed. Press once to begin movement, again to stop.

**Up:** Moves the blade arm up. Momentarily pressing the button moves the blade arm the set thickness amount. Pressing the button for longer than one second moves the blade at the fastest travel speed.

**Down:** Moves the blade arm down. Momentarily pressing the button moves the blade arm the set thickness amount. Pressing the button for longer than one second moves the blade at the fastest travel speed.

#### Speed

**Oscillation:** Pressing these buttons increments (+) and decrements (-) the blade oscillation speed.

**Advance:** Pressing these buttons increments (+) and decrements (-) the blade arm advance speed.

#### Thickness

Pressing these buttons adjusts the slice thickness. Pressing momentarily changes the setting in 1 micron increments. Holding for longer than 1 second causes 10 micron changes.

#### Travel Window

**Reverse Limit:** Pressing this button sets the position for the blade arm to start the slice process. The limit can be changed using the blade position buttons at any time to override the limit. Pressing this button again will set the new limit.

**Forward Limit:** Pressing this button sets the position for the blade arm to stop and return to the reverse limit. The limit can be changed using the blade position buttons at any time to override the limit. Pressing this button again will set the new limit.

#### Multiple Slice

**Start/Stop:** Pressing this button starts the process of automatically slicing. Pressing this button once will begin the blade arm moving forward. It will continue until it reaches a forward limit (travel window or mechanical) stop, return to the reverse limit, step down the selected thickness, and begin another slice. Pressing this button during this process will cause the arm to stop and wait for a command. The multiple slice process will continue until the lowest mechanical limit is reached. It will then automatically return to the home position (full up and back).

#### Zero

Pressing this button resets the slice counter display to read all "0".

#### Home

Pressing this button at any time will cause the blade to return to the home position.



#### 1. Slice Counter/ Thickness

Displays a count of the number of slices from a user defined zero reference. When prompted, displays the slice thickness setting in microns.

#### 2. Oscillation

Displays the speed of the blade oscillation in bar graph form. Each line of the graph represents a speed.

#### 3. Advance

Displays the speed of the blade advance in bar graph form. Each line of the graph represents a setting in microns.

#### 4. Refrigeration Controller

#### 5. Tray

### Different Mounting Options

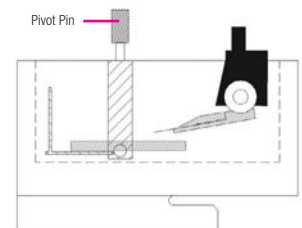
Mounting of the specimens can be done directly on our unique tissue pedestal with the option of using the pivot pin (see diagram 1) or just setting the pedestal flat on the bottom of the tray on a 90° angle (see diagram 2). In addition, a sample vice holder, with pivot pin can be attached to the tray and mounting blocks used (see diagram 3). Both devices come standard with the EMS 5000.

The cutting angle can be easily changed and calibrated by loosening the set screw on top of the support arm. The angles between 10-20° can be read off the scale on the side of the support arm.

#### Diagram 1

##### Standard Pivoting Tissue Pedestal

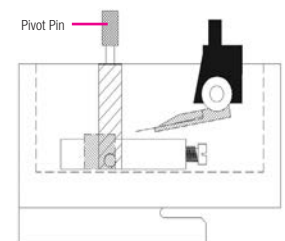
The pivot pedestal arrangement is designed so that the sample can be glued directly to the surface and the angle of the sample can be adjusted relative to the blade.



#### Diagram 2

##### Standard Tissue Pedestal

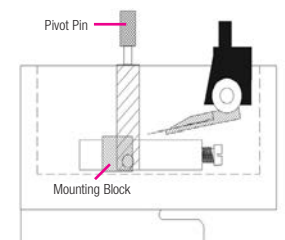
This is the same pedestal as in diagram one; however you have the option to mount the pedestal flush to the base on a 90° angle.



#### Diagram 3

##### Sample Vice Holder

The sample vice which is provided with the system can be easily alternated with the pedestal. 1.2cm square mounting blocks (provided with the system) or the other pegs are held by the vice clamp.





## Specifications

<b>Vertical travel:</b>	28mm
<b>Slice Thickness:</b>	Adjustable from 1 to 999 microns in 1 micron increments
<b>Blade Speed:</b>	Adjustable from 50- 5000 cycles per minute
<b>Blade Angle Adjustment:</b>	Adjustable from 15°-35 °
<b>Blade Travel:</b>	35mm total
<b>Blade Types:</b>	Sapphire, Razor, Diamond, Glass
<b>Blade Advance Speed:</b>	Continuously adjustable from 100 microns-5mm per second
<b>Blade Reverse Speed:</b>	2.5 mm per second
<b>Specimen Size:</b>	25mm Wide x 25mm Dia. x 15mm High maximum volume
<b>Magnifier:</b>	4" diameter, X2 lens mounted on 12" (30cm) gooseneck, 9" working distance
<b>Lighted:</b>	White LEDs mounted on the knife holder aimed at blade edge.
<b>Dimensions: Slicer</b>	27cm x 40cm x 21.5cm (10.5" x 16 x 7.5")
<b>Keypad</b>	17cm x 8.5cm x 3.4cm (6.7" x 3.4" x 1.35")
<b>Weight:</b>	13kg (30 lbs)
<b>Power Requirements:</b>	110-240VAC, 50-60Hz universal power input. Available with CE Mark
<b>Display:</b>	3 segment LED display of slice counter and thickness. (Changes with appropriate buttons) 20 segment LEDs bar graph display blade oscillation and advance speed.
<b>Specimen Mount:</b>	X, Y, Z axis adjustable pedestal: 1¼" x 2 ½"
<b>Mounting Blocks</b>	½ x ½ x ½ " (3 each) / 1 x 1 x 1" (3 each)
<b>Working Space Requirements:</b>	12" Wide x 18" Dia. x 10" High (30cm x 45cm x 25cm)

### 5000 Series Refrigeration Controller and Tray

<b>Temperature Control Range</b>	0°-10°C
<b>Temperature Indication</b>	3 digit LED display indicates temperature in 0.1oC with a negative sign indicator.
<b>Power Requirements</b>	115/230V AC 50-60 Hz auto ranging fused at 1 amp max current
<b>Dimensions</b>	Control Module: 8.25 x 6.25 x 5.5" (20.9cm x 15.9cm x 13.9cm) Cooling Tray: 4.25 x 3.5 x 2.625" (10.8cm x 8.9cm x 6.7cm) with a 3' cable (91.4cm)

## Ordering Information

Cat No.	Description	Qty.
<b>93200</b>	<b>EMS 4500 Oscillating Tissue Slicer</b> with: 2.5" wide media tray with pedestal, Razor Blades (25/pk), Gooseneck Magnifying Lens LED Lights, Adhesive, 1/16" hex key for blade angle adjustment and Operating Instructions, 110V-240V.	each
<b>93205</b>	<b>EMS 5000 Oscillating Tissue Slicer</b> with: 2.5" wide media tray with pedestal, Specimen Vice Holder for 2.5" tray, Razor Blades (25/pk), Anodized Aluminum Blocks-Both Sizes (3/pk), Foot Switch with 6' Cable, Gooseneck Magnifying Lens LED Lights, Adhesive, 1/16" hex key for blade angle adjustment and Operating Instructions, 110V-240V.	each
<b>93226</b>	<b>EMS 5000 Control Module and Refrigeration tray</b>	each
<b>93220</b>	<b>EMS 5000 With Refrigeration</b> including 2.5" wide media tray with pedestal, Specimen Vice Holder for 2.5" tray, Razor Blades (25/pk), Anodized Aluminum Blocks-Both Sizes (3/pk), Foot Switch with 6' Cable, Gooseneck Magnifying Lens LED Lights, Adhesive, ¼" hex key for blade angle adjustment, and Operating Instructions, 110V-240V.	each

### Replacement Parts

<b>93050</b>	Large (3.5" [95x25x73mm]) Tray-Complete including Fixed Stage and Adjustable Pedestal	each
<b>93401</b>	Standard (2.5") Tray	each
<b>93402</b>	Large Tray Only	each
<b>93404</b>	Fixed Stage Pedestal for Large Tray Complete	each
<b>93030-C</b>	Pedestal for Standard Tray, Complete Assembly	each
<b>93030</b>	Surface for Standard Tray Pedestal	each
<b>93211</b>	Specimen Vice	each
<b>72588</b>	Specimen Adhesive (5/pk)	each
<b>93034</b>	Mounting Blocks ½"	3/pk
<b>93035</b>	Mounting Blocks 1" (3/pk)	3/pk
<b>93036</b>	Magnifier	each
<b>93037</b>	Foot Switch	each
<b>93020</b>	General Purpose Razor Blades	25/pk
<b>Optional Accessories</b>		
<b>93039</b>	Glass Blade Holder	each
<b>93041</b>	Sapphire Blade Holder	each
<b>93060</b>	Sapphire Blade	each

### Slicer Kit

To make your job easier we have put together a kit of accessories that will assist you when using our Oscillating Tissue Slicer.

Complete Kit includes: Sable brush, Parafilm 4 x 250', Quick Bond (5 tubes/pk), Kimwipes, Set of tweezers (#5, #6, #7) Fontax, Specimen forceps (4", 6"), Sample specimen bottle with cap-8ml (6per pack), Glass Microbeakers 5 ml (6 per pack), Glass Microbeakers 7.5 ml (6 per pack). All items in the kit can be purchased separately.

<b>93040</b>	Slicer Kit	kit
<b>EMS 4000 Replacement Parts</b>		
<b>93030-C-4000-P</b>	2.5" Tray and Pedestal Assembly	each
<b>93401-4000</b>	Standard (2.5") Tray	each
<b>93030-C-4000</b>	Small Pedestal Complete Assembly	each
<b>93050</b>	Large Tray with pedestal	each
<b>93030-4000</b>	Standard Pedestal Surface Only	each
<b>93031</b>	Large Pedestal Surface Only	each
<b>93034</b>	Anodized Aluminum Mounting Blocks 1/2"	3/pk
<b>93035</b>	Anodized Aluminum Mounting Blocks 1"	3/pk
<b>93037</b>	Foot Switch	each
<b>93031-C</b>	Pedestal for Large Tray, Complete Assembly	each
<b>93026</b>	Light Bulb	each
<b>93020</b>	General Purpose Razor Blades	25/pk

### Recommended Accessories

<b>93038</b>	Glass Knife Holder: Allows you to reproducibly cut fresh (10µm sections) and fixed tissue. This holder attaches directly to the unit and will accommodate 6.4mm x25mm glass knives.	each
<b>71016</b>	Histology Glass Knife Strips; (6.4mm x 25mm x 400m) 30 per pack. Saver.	each
<b>93050</b>	Large Media Tray with Pedestal. 95 x 25 x 73mm (internal dimensions).	each



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